

5                                   **SPICE MILL WITH MEANS FOR INFINITELY**  
   **SETTING THE GRINDING FINENESS**

CLAIM FOR FOREIGN PRIORITY UNDER 37 U.S.C. § 119

                  This application claims foreign priority to Swiss Patent Application No. 0361/03,  
10   filed March 20, 2003.

TECHNICAL FIELD OF THE INVENTION

                  The invention relates to a spice mill. More specifically, the invention relates to a spice  
mill which may be adjusted in order to set the fineness of the ground particles.

15                                   BACKGROUND OF THE INVENTION

                  A conventional pepper mill is shown in section in Fig. 4. It consists of a hollow body,  
which at its lower side comprises a grinding device 20, wherein the grinding device consists of  
inner and outer grinding teeth 201, 202. A connection rod 30 passes through the inner grinding  
20   teeth 201. The upper and lower ends of the connection rod 30 project out of an upper terminal  
cap 40 and out of the inner grinding teeth 201, respectively, with the upper terminal cap 40 and  
inner grinding teeth 201 being incorporated in the hollow body 10. The ends of connection rod  
30 are fastened by tightening the nuts 301 and 302, so that on rotation of the upper terminal cap  
40 the connection rods are co-rotated and the inner grinding teeth 201 likewise rotate, whereby  
25   the pepper grains are ground.

                  The size and the fineness of the ground pepper grains may be set by screwing in and out  
the nut 302, which is located at the lower end of the connection rod 30. This results in the  
movement of the inner grinding teeth upwards and downwards, which in turn allows the play  
between the inner 201 and outer 202 grinding teeth to be set, thereby setting the fineness of the  
30   ground particles.

5            Since, however, the nut 302 is not fastened on the connection rod with a rigid abutment, it is possible, in the case of incorrect handling, for the nut 302 to fall out during use. This may also occur during rotation of the upper terminal cap for grinding the pepper grains, and, in the worst case, as a result of this the nut 302 may fall into the food to be spiced, for example soup.

10           The setting of the degree of fineness by manipulating the nut 302, which has to be small, is furthermore impractical and requires significant manual skill, which can be problematic, for example, for older persons. In addition, the nut 302 is dirtied with particles of the product to be ground with each grinding procedure and an adjustment of the grinding fineness is not possible without the user getting dirty fingers.

15           It is therefore the object of the present invention to provide a mill which overcomes these disadvantages.

#### SUMMARY OF THE INVENTION

20           The present invention provides a spice mill, in particular a pepper mill, having an improved design for setting the fineness of ground particles produced by the mill. The inventive mill includes outer grinding teeth positioned in a circular arrangement and rigidly located within a fixed seat. A rotating seat is provided which can be engaged from the outside of the mill and rotated in order to set the fineness of the ground particles. The fixed seat is connected to the rotating seat by means of a convex annular bead and a concave annular groove, which prevent movement of the rotating seat away from the fixed seat during rotation. Inner grinding teeth are moveably positioned within an inner circumference of the outer grinding teeth and are supported by a lift seat, which is connected to the rotating seat by means of threaded peg which may be screwed into a threaded bore provided on the rotating seat. Spokes on the lift seat are engaged in vertical guide grooves located on the inner wall of the fixed seat whereby, on rotation of the rotating seat, the lift seat is moved upward or downward and the inner grinding teeth are shifted upwards or downwards, thereby setting the size and the fineness of the ground particles produced by the mill.

#### BRIEF DESCRIPTION OF THE DRAWINGS

35           The spice mill according to the present invention is hereinafter described in combination with the drawings, wherein:

5 Fig. 1 illustrates an exploded view of a spice mill according to the invention;

Fig. 2 illustrates a longitudinal section through a spice mill according to Figure 1 in the assembled condition;

10 Fig. 3 illustrates a detailed view of the grinding gear and of the adjustment mechanism of the mill according to Figs. 1 and 2 in the longitudinal section; and

Fig. 4 illustrates a longitudinal section of a conventional spice mill.

## 15 DETAILED DESCRIPTION OF THE INVENTION

With reference to Figs. 1 and 2, the inventive spice mill includes a housing 1, a shaft seat 2, a fixed seat 3, a grinding device 4, a lift seat 5 and a rotating seat 6, wherein the housing 1 is a hollow container for accommodating the spice, for example pepper, grains. The lower end of housing 1 is assembled on the shaft seat 2, preferably by means of a screw attachment. Rotary  
20 peg 21, which runs downwards from the middle of the shaft seat 2, is polygonal, preferably rectangular, in cross section and is in active connection with inner grinding teeth 41, whereby rotation of housing 1 leads to the rotation of inner grinding teeth 41.

The upper end of fixed seat 3 is rotatably connected, but not axially displaceably connected, to the shaft seat 2. Outer grinding teeth 42 are arranged in the inside of the fixed seat  
25 3. Multiple vertical guide grooves 32 are provided on the inner surface of the fixed seat 3, near to its lower edge. An annular, concave circumferential indentation 33 is provided below the guide grooves 32. This indentation 33 is sized to receive a convex ring, or annular bead, 62 which is provided on the rotatable seat 6.

The grinding device 4 comprises the inner grinding teeth 41 and the outer grinding teeth  
30 42. A continuous bore 411 is provided in the middle of the inner grinding teeth 41. This continuous bore 411 has a rectangular shape and is sized to receive the rotary peg 21. The outer grinding teeth 42 are assembled on the seat 3 in a rotationally fixed manner and are not displaceable in the axial direction. Inner grinding teeth 41 are located on the inside of outer grinding teeth 42.

35 A central bore 51 is provided in the middle of the lift seat 5. This central bore is aligned with the continuous bore 41, and also receives the rotary peg 21. Multiple spokes 52 run

5 outwards from the periphery of the lift seat 5. Each spoke 52 is allocated to a guide groove 32 of the fixed seat 3 and is received by this guide groove 32 in the assembled condition.

A threaded hollow peg, or tube, 53 extends downward from the outer side of the central bore 51 of the lift seat 5. Hollow peg 53 may be correspondingly screwed into a threaded bore 61 provided in the central part of the rotating seat 6. The outwardly directed convex annular  
10 bead 62 is provided on the outer annular wall of the rotating seat 6, and may be correspondingly introduced into the concave ring 33 of the fixed seat 3.

As shown in Fig. 3, rotating seat 6, which may rotate in a clockwise or anti-clockwise direction, may be engaged from the outside of the mill. In one embodiment, rotating seat 6 is engaged by means of adjustment ring 63. The position of the rotating seat 6 is fixed in the axial  
15 direction. The spokes 52 on the lift seat 5 are guided by way of guide grooves 32 such that they may be moved up and down in the fixed seat 3 within defined limits. When the annular rotating seat 6 is rotated, the lift seat 5 is moved infinitely upwards or downwards along the central axis due to the thread design of the threaded peg 53 on the lift seat 5 and the threaded bore 61 provided in the rotating seat 6. Since the inner grinding teeth 41 are arranged on the lift seat 5,  
20 as a result of the lifting and lowering movement of the lift seat 5, the inner grinding teeth 41 are moved upwards or downwards. The inner grinding teeth 41 are pressed downwards onto the lift seat 5 by means of a spring 8. By changing the distance between the inner grinding teeth 41 and the outer grinding teeth 42, an infinite setting of the fineness and the size of the particles produced by grinding is achieved.

25 Practical trials have shown that the spice mill of the present invention has the following advantages:

1. Since a convex bead and a concave annular groove are provided between the rotating seat 6 and the fixed seat 3, it is ensured that the rotating seat 6 does not  
30 move away from the fixed seat 3 whilst it is being rotated.
2. Since the fixed seat 3 is provided with guide grooves for spokes 52 on the lift seat 5, the lift seat 5 is pressed upwards or downwards upon rotation of rotating seat 6, whereby a linear movement of the lift seat 5 is ensured and no deflection  
35 is caused.

- 5            3.     Since the rotating seat 6 may be engaged and rotated from the outside, no complicated manipulation with a small nut dirtied by ground material is required for infinitely setting the grinding fineness.